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AUTHOR Ferland, Raymond A.; DiMaria, Joseph P.
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ABSTRACT

As a solution to the problem of serving large numbers of students with a small staff, the Community College of Rhode Island (CCRI) has adopted three new technologies to advise and register students and respond to telephone inquiries. The first of the technological innovations is TELUS, a telephone voice response registration system offered as an option to in-person and mail-in registration and designed to make registration a simple, efficient, cost-effective process. The second is ON COURSE, an automated degree audit/advisement system, designed to provide for the delivery of consistent, quality advisement relative to degree requirements and course selection. The third technology is PhoneMaster, an automated telephone notification and call routing system designed to place routine calls while personnel concentrate on calls that demand individual attention. A fourth tool, currently under consideration, is Schedule 25, a software package designed to automate space allocation for courses. This description of CCRI's new technologies provides for each: (1) an overview of the function of each technology; (2) the methods under which the college operated prior to the procurement of the technology; (3) the current method of operation; (4) the current versus prior levels of productivity; (5) the costs to procure the system; and (6) cost-benefit projections as a result of the procurement. (JMC)

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EFFECTIVE SYSTEMS TO COPE WITH INCREASING DEMANDS
AND DECREASING DOLLARS

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Raymond A. Ferland, Vice President for Student Affairs
and
Joseph P. DiMaria, Dean of Admissions and Records
COMMUNITY COLLEGE OF RHODE ISLAND
Warwick, Rhode Island

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INTRODUCTION

The Community College of Rhode Island is the largest public 2-year degree granting college in New England. From its modest beginning with 325 students in 1964, the College has grown steadily to its present record enrollment of 17,300.

CCRI offers programs in academic and vocational-technical areas as well as a full complement of programs and services for full- and part-time students, for recent high school graduates and for older, adult learners. These programs are offered at campuses in Warwick, Lincoln, and Providence and courses are offered at satellite facilities in East Providence, Middletown, Newport, Westerly, and Woonsocket.

CCRI grants the Associate in Arts (A.A.), the Associate in Science (A.S.), the Associate in Applied Science (A.A.S.), the Associate in Applied Science in Technical Studies (A.A.S.-T.S.), and the Associate in Fine Arts (A.F.A.) degrees. Several one-year certificates are also awarded.

CCRI opens its facilities for public use, sponsors programs on issues of public concern, and offers workshops and seminars

for small businesses, for government agencies, and for individuals seeking to improve their skills or enhance their lives.

In every sense, CCRI strives to be Rhode Island's community college meeting the educational needs of the communities and people of the state.

Similar to many institutions of higher education across the nation, CCRI has been struggling over the past few years with finding ways to cope with decreasing state appropriations during a period of record enrollment. The use of technology has been adopted as a solution to the problem of serving large numbers of students with small and ever shrinking staffs. CCRI has placed into operation several relatively new technologies for the purpose of advising and registering students and for the purpose of responding to telephone inquiries. Currently under study is the procurement of an automated room scheduling package.

Today, we will discuss the technologies that CCRI has adopted, their costs, and the savings that were generated as a result of this implementation.

The four technologies are:

1. TELUS - Telephone Voice Response Registration System,

2. ON COURSE - Automated Degree Audit/Advisement System,
3. PhoneMaster - Telephone Notification and Call Routing System, and
4. Schedule 25 - Room Scheduling Package soon to be purchased.

The presentation will be given in the following manner:

First, an overview of the function of each technology will be given;

Second, the methods under which the College operated prior to the procurement of the technology will be presented;

Third, the current method of operation, the current verses prior levels of productivity, the costs to procure the systems, and the cost benefit projections as a result of procurement will be discussed.

First Technology - Telephone Voice Response Registration System

Computerized voice response registration systems are currently available from a number of vendors. They operate on a variety of computer systems. In this instance, the effective cost benefit as defined by the manufacturer is at the level of

3,000 or more students.

Overview:

The purpose of the system is to make registration a simple, efficient process that is cost effective. The technology turns a touchtone phone into a computer terminal whereby phone signals are digitized and interpreted by the hardware as keyboard entries.

The basic system allows for eight phone lines to become interactive with a computer mainframe. Additions to the number of phone lines to the system are made in multiples of eight.

The basic premise is that students who are given an option to register by telephone, as compared to the normal processes of in-person registration or registration by mail, will choose telephone because it:

1. Saves time and a trip to the institution;
2. Eliminates long queues; and
3. Gives immediate feedback to the student by confirming registration as it occurs.

In addition to these features, the Community College of Rhode Island has opted for telephone registration because it also:

1. Provides better information about demand for courses;
2. Allows for early billing; and results in increased service to students and substantial savings in personnel costs.

Prior Method of Operation

Prior to the procurement of voice response telephone registration, CCRI conducted a pre-registration that lasted four days and three evenings, a walk-in registration that was scheduled for eight days and seven evenings, and a mail registration that lasted for approximately four weeks.

The cost of operating in these modes was excessive in that faculty advisors, department representatives, and counselor/advisors needed to be available to assist in the selection of courses and in the registration for classes. Also, many data input operators were needed to serve the large population at the Community College. On the occasions when registration was conducted as pre-registration or as walk-in, the College found it necessary to have as many as eight temporary employees to handle the concentrated workload associated with these projects. In addition, the College paid overtime to permanent employees who "manned stations" at pre- and in-person registration.

Total personnel dollars expended to operate registration in

the way described above amounted to about \$33,000 per year. The approximate cost for temporary personnel and overtime for data entry personnel totaled \$13,500 for each of the fall and spring semesters and about \$6,050 for the summer session. The students' needs were being satisfied but at a cost that was escalating and being scrutinized by administration.

Present Methodology

Today, CCRI offers telephone voice response registration to its students. The system selected was one manufactured by Perception Technologies, Inc. This system is one of many on the market. The selection of this particular system was necessitated by the hardware configuration and the software operating system used at CCRI. CCRI utilizes the Information Associates Software system and operates in a DEC environment.

The Community College presently uses 16 phone lines and is contemplating the purchase of an additional 8 lines. The education curve of our student body has been one of rapid growth. In the past two years, the percentage of students who register by phone has grown from 30 percent to nearly 88 percent.

The major difference in the operation is that registration is now offered to all markets over a three-month period of time for the spring (November through January), over a two-month

period for the summer (April and May) and over a six-month period for the fall semesters (April through September). The in-person, pre-registration, and mail registration processes which were always labor intensive are no longer conducted. Essentially, the annual personnel cost associated with registration has been cut by \$26,350 dollars. Walk-in registration has been reduced to three days and two nights. This reduction has been a result of the high acceptance of telephone registration and the fact that only new students who are making last minute decisions to enroll at CCRI are required to register in-person. For example, in the fall of 1991, only 2,012 of 17,331 students at CCRI opted to register in-person.

Cost, Savings and Pay Back

The cost to purchase the system was \$80,000. This was a one-time cost.

The College anticipates that it has saved \$48,000 since the system was purchased. Further, the projected annual savings should amount to \$26,350 per year in future years. What began as a system with an anticipated pay back over a five- and three quarter year period has resulted in an actual pay back of three and a half years.

The College is now exploring the option of increasing its incoming call capacity to 24 lines. The cost for this expansion

would be \$10,000. The cost is justifiable because the system has been widely used by our students and it is believed that easy access to the college is paramount in a decision to study at CCRI.

One final note about voice response telephone registration systems: If a significant number of students choose to register earlier than traditionally because the process is convenient, then the billing process for tuition can take place earlier than previously. Increased billing should lead to increased earlier collections. If only 1,000 students register four weeks earlier than customarily, and if those same students pay an average of \$400 per registration, then the institution is at the very least able to earn interest on \$400,000 of revenue which it has collected four weeks prior to what would otherwise be its normal business practice. It is estimated that \$400,000 on deposit for 30 days will yield \$2,000 in interest. This interest income can help to offset cost of purchase.

The Second Technology - Automated Degree Audit/Advisement Systems

The Community College of Rhode Island has recently instituted an automated degree audit/advisement system, ON COURSE. The delivery of consistent, quality advisement to the student population at a reasonable cost was the major impetus for the installation of this system.

Automated degree audit/advisement systems are specifically designed for providing academic advisement relative to outstanding degree requirements and course selection as it relates to the completion of a selected major. The advisement system also has the capability of allowing a student to select and inquire about alternative majors so that they can be audited against the number and types of credits the student has earned as a potential degree candidate.

Prior Method of Operation

Prior to the installation of the ON COURSE degree audit/advisement system at the Community College of Rhode Island, the institution allowed students to self-select for advisement. Advisement was not mandatory. The student determined on an individual basis if he/she needed advice about which course(s) met his/her plan of study.

Because the number of students who would self-select was undetermined, the College was obliged to hire a large number of faculty advisors to handle increased workloads at the time of pre-registration and registration. The cost in personnel dollars was significant in that ten faculty were hired to staff the advisement function for ten hours per day for 20 days per year. In addition, six counselors were paid at a lecturer's rate for the same number of days. Advisors at satellites numbered six and were paid for evening hours from 4:00 - 9:00 p.m. for 20 days per

year.

The approximate cost of advising students amounted to \$35,200 per year. Even at that rate of expenditure only 2,000 students for the fall and spring terms and 1,200 students for the summer session opted for advisement. The cost of advising a student, based on a number which represented only a fraction of the total student population, was about \$6.77 per student. The College recognized that if advisement were made mandatory, the cost to provide an in-person service would be prohibitive. Furthermore, there were convincing arguments that the quality of advisement would not be consistent throughout the College. For those reasons, CCRI sought to approach the problem from a different perspective.

Present Methodology

The Community College currently employs ON COURSE. ON COURSE is a software package that is manufactured by Information Associates, Incorporated. It is essentially a system that represents a table of requirements for programs based on "Catalog Year." The student database is tagged with the Catalog Year in which the student is accepted into a program. The course work attempted and completed by the student is monitored against the catalog year of the program in which the student is accepted and a report is generated based on the audit of completed courses for a catalog year program. This process can take place in an

on-line environment or in a batch process.

Audit/advisement reports are made available to students. First, through a batch process, a CCRI student is mailed an "Audit/Advisement Report" once each semester, two weeks prior to the start of registration. The timeline is November 1 for spring registration which begins on November 15 and March 15 for summer and fall registrations which are scheduled to begin on April 1 and April 15 respectively. There is no charge to the student for this service. Second, students who wish to have an audit/advisement report generated based on a major which is other than that in which they are matriculating or the student who misplaces the report which was mailed to him/her may have one generated by way of an on-line request. A fee of \$2.00 per request is charged for these inquiries or duplications.

Cost, Savings and Pay Back

The purchase and installation cost of the Degree Audit/Advisement system was \$72,000. The purchase was justifiable given the actual payments that the College was making for the traditional in-person advisement service. Also, 100 percent of the degree seeking students receive consistent quality advisement, rather than the 12 to 15 percent of the degree candidates that self selected for advisement.

To summarize, the newly automated degree audit/advisement

system and the services of faculty and advisor/counselors who work at registration are required and utilized during in-person registration only. Since in-person registration has been reduced to just three days and two evenings per semester, the costs associated with paying for advisement services have been reduced substantially. In the recent past, personnel costs associated with advisement for registration totaled \$35,200 per year. Under the new system, that amount is approximately \$11,000. It is anticipated that the Automated Degree Audit Advisement Tool will reach its pay back in just two and a half years. Also, the delivery of consistent advisement to all degree candidates justifies the purchase with or without savings.

The Third Technology - PhoneMaster - An Automated Phone
Notification and Call Routing System

The third technology to be presented is PhoneMaster. The system is produced by U. S. Telecom. The purpose of the system is to place calls automatically and route incoming calls. The features of this technology are innumerable. The cost of the system is about \$3,500.

PhoneMaster is designed to handle placing routine telephone calls, thus freeing personnel to concentrate on telephone calls that demand individualized attention.

The PhoneMaster System is personal computer based. At CCRI

PhoneMaster has been installed on an IBM Personal System 2 Model 50 Z computer. The computer has a hard disk with 30 meg of memory.

PhoneMaster is a package composed of both hardware and software. The hardware portion of the system is a board that fits directly into the personal computer. This board digitizes a voice message for storage into memory. The software allows for the building and use of message files and student database files that include phone numbers.

The Office of Admissions and Records has experienced severe cuts in personnel in recent years. The financial condition of the state is such that personnel who leave or retire are not easily replaced, if they are replaced at all. The College has sought a method to handle calls that it considers routine with an eye toward looking at better ways to serve the student. Phone Master has helped the College accomplish these tasks.

By means of selecting specific data elements, the College's computer center builds a file for export from the Student Information System Main Frame database to the PhoneMaster Software. The selection criterion is developed by the user. It includes the specific definition of the student population to which a formal message will be sent. In addition, the file contains the name and phone number of persons selected so that telephone calls may be placed.

Once activated, PhoneMaster places a call, delivers a specific message, and if requested, collects a response. Phone numbers which are not answered are placed in a queue for calling at a future time.

The calling takes place at a time predetermined by the operator. The calling time can be suspended and restarted by means of a clock which resides in the personal computer.

Calls can be received via PhoneMaster throughout the day, whenever out going calls are not being placed. Calls are routed according to the telephone extension selected by the caller. The caller makes his selection based on his knowledge of the system or after having been taken through a menu.

Prior Method of Operation

Prior to the purchase of PhoneMaster, all calls were taken and placed individually by clerical personnel. The decrease in staff and the increase in inquiries about CCRI made the task a difficult one. During the past academic year, approximately 45,000 inquiries were handled by the Office of Admissions and Records. Most of these inquiries were by phone. Similar to most institutions, the Admissions Office and the Registrar at CCRI receives many calls which require the attention of other offices. However, these calls are forwarded to Admissions and Records due to its high visibility within the institution.

Decrease in staff and increases in enrollment at CCRI led to the investigation of the best way to handle some of these routine communications. For example, in the past when classes were canceled due to insufficient enrollment just prior to the start of the term, a number of clerical personnel were hired to assist students in selecting and registering for alternative courses. The task was laborious; it lacked organization and oftentimes it was difficult to monitor which calls were actually placed. The task of re-registering students by phone became burdensome. Automation was selected as an alternative.

Present Methodology

CCRI currently uses the PhoneMaster System to call students who lose course registrations due to insufficient enrollments. However, it is recognized that the system has many other applications such as placing calls to students who have outstanding admissions or financial aid application requirements and students who have not yet paid a bill prior to dropping them from course registrations for non payment.

CCRI recognized years ago that students who are canceled from courses due to insufficient enrollment are consumers whose needs are not being met. They are a population that can be discouraged from pursuing their education, and they can easily develop poor feelings about an institution which courted their enrollment and then broke the relationship by canceling a course.

Cost, Savings and Pay Back

Of the more than 17,000 students who enroll at CCRI each semester, some 500 persons are canceled from courses. In an effort to satisfy their needs and recover potentially lost revenue, the Office of the Registrar is assigned the responsibility of making phone calls and assisting persons who have lost their courses to register in other courses. The timeliness of this action is crucial to promoting goodwill and recuperating potentially lost income.

In order to be timely, the Office of the Registrar had to hire ten people who worked on this task for two ten-hour days each semester. These telephone operators placed calls for the purpose of informing students about cancellation and for the purpose of offering alternative courses of study. The cost of operating in this fashion was approximately \$2,540 per semester or \$7,620 per year. PhoneMaster in conjunction with voice response registration eliminated that expenditure.

It's important to note that the percentage of calls converted to re-registrations has actually risen from 40 percent prior to any phone contact to 60 percent after initiating phone contact and to nearly 75 percent with the use of PhoneMaster and voice response registration. Telephone contact with approximately 500 persons registered in at least one course resulted in 375 course re-registrations and the recovery of

\$67,500 in potentially lost income per semester or \$202,500 per year. The net increase that PhoneMaster and voice response telephone registration contributed to this figure was about \$13,500 per semester or \$40,500 per year. The pay back for PhoneMaster was met in its first semester of use.

The Fourth Technology - Schedule 25

The last technology offered for your consideration is one which the College is currently reviewing for adoption. It is a system which will allow the College to schedule its space efficiently and effectively. The tool is Schedule 25, a software package developed by Universal Algorithms Incorporated. Through two databases, it takes into account such factors as energy loads, teaching modalities, location, size, and physical characteristics of space, etc.

The first database is one which takes into account the particular requirements of a course. The database will include such factors as the mode of instruction, lab or lecture, the need for audio visuals, the normal seating capacity, the need for class computers, etc. Seventy-nine specific characteristics can be included in the database. These data are tied to the course directory.

The second database is related to the room inventory of the institution. The room inventory can have up to 79 special room

characteristics. Examples of the data contained in this file would be seating capacity, blackboards, furniture configurations, audio visual outlets, computer devices, etc.

The Schedule 25 software provides a "best fit" for scheduling based on the relationship between course requirements and physical plant. By way of an algorithm, course requirements and available space are modified. The system is sensitive to maximizing location preferences so that academic department offerings can even be set for specific buildings and/or regions in buildings.

Schedule 25 is designed to eliminate weeks of work. It guarantees first-time compatability of room to course at a rate of 85 percent. For CCRI, the system would take approximately nine minutes to schedule three campuses with over 222 classrooms, laboratories and conference rooms, and more than 800,000 square feet of space. The use of Schedule 25 at CCRI would save the Office of the Registrar about 8 person-weeks per semester, or nearly 20 person-weeks per year--the amount of time currently expended by the Assistant Registrar to build a Master Schedule of Course Offerings.

Also, the system can be used for modeling. The impact on space utilization of such factors as changing the number of minutes in a class period or the unavailability of a corridor of rooms can be easily determined. Similarly, the impact of

constructing certain size and types of educational facilities can also be measured so that good decisions about expansion or downscaling can be made.

By way of an "add-on" the system can also provide immediate event scheduling and answers to routine questions about room availability.

Cost and Projected Savings

Schedule 25 is sold in modules so that cost is relative to the size of the institution. In order to allow for growth, CCRI has anticipated a one-time expenditure of \$21,000 plus an annual user fee of \$2,100 which is renewable every five years.

In addition, CCRI is seeking a Multiple User Schedule 25E system for the purpose of special event scheduling. The one-time fee for that add-on is \$7,450 with an annual user fee of \$894 which is also renewable every five years.

The initial cash outlay would total \$28,450 plus annual user fees of \$2,994. The College projects that a five percent savings in energy would amount to \$75,000 per year. Every savings coupled with the savings associated with the time of the Assistant Registrar results in an almost immediate pay back.

Closing

This concludes the formal presentation on technologies that have helped and will help CCRI operate in this time of tight budgets and high demands. We caution that there are many manufacturers of systems similar to those about which we spoke. Our intention in this presentation was not to tout any one manufacturer but rather to introduce you to some positive advances in technology that are available to you so that high quality service can continue to be provided to your clients in spite of the financial cuts that you are experiencing.

We now welcome any questions that you may have of us.

We will be at the conference through its conclusion. If you would like to discuss these technologies at a later time, we would welcome that opportunity.